The Canadian Entomologist.

VOL. XXXVII. LONDON, DECEMBER, 1905. No. 12

THE INFLUENCE OF THE APIDÆ UPON THE GEOGRAPHICAL DISTRIBUTION OF CERTAIN FLORAL TYPES.

BY J. ARTHUR HARRIS, ST. LOUIS, MO.

(Continued from page 380.)

The distribution of the 16 genera and 376 species of the Dilleniaceous type is shown in table D.

TABLE D.

Dilleniaceous Type.

Region.	Genera.	Species.
1	4 = 25.00%	14 = 3.72%
2	2 = 12.50%	15 = 3.99%
3	10 = 62.50%	220 = 58.50%
4	6 = 37.50%	75 = 19.95%
5	1 = 6.25%	3 = .77%
6	6 = 37.50%	22 = 5.85%
7	1 = 6.25%	7 = 1.86%
8	2 = 12.50%	6 = 1.60%
11	3 = 18.75%	8 = 2.13%
12	3 = 18.75%	6 = 1.60%

The differences observable in the percentages of this table and those obtained for the Solanum-Cassia type are doubtless to be accounted for in part by the small number of genera and species.

Except for minor differences, the distribution of the 152 genera of the Melastomataceous type, all but three of which belong to the type family, is very similar to that of the Solanum-Cassia type.

TABLE E.

Genera of the Melastomataceous Type.

Region.	Endemic.	Others.	Total.
1	13 = 8.55%	6	19 = 12.50%
2	8 = 5.26%	2	10 = 6.57%
3	22 = 14.47%	9	31 = 20.39%
4	96 = 63.15%	1	97 = 63.81%
5	93 = 1.97%	1	4 = 2.63%
6	.....	4	4 = 2.63%
12	.....	6	6 = 3.94%
13	1 = .65%	0	1 = 6.65%

This type is confined to eight of the fourteen regions. Over 63 per cent. are found exclusively in the tropical American region. The distribution of the species has not been figured in detail, but about 73 per cent. are tropical American, and the remaining 27 per cent. are almost exclusively confined to the tropical African and Indian regions.

Aside from a comparison by species, which is at the present moment impracticable, a summation of the distribution of the genera of all types in comparison with the total number of genera of flowering plants will furnish the most satisfactory test of the hypothesis of the greater local differentiation of certain floral types. Table F makes clear the distribution of the 227 apically dehiscent genera of all three types.

TABLE F.

Summation of Genera, All Types.

Region.	Endemic.	Others.	Total.
1	16 = 7.04%	17	33 = 14.53%
2	9 = 3.96%	11	20 = 8.81%
3	34 = 14.97%	23	47 = 20.70%
4	116 = 51.10%	13	129 = 56.82%
5	5 = 2.20%	5	10 = 4.40%
6	13 = 5.72%	15	28 = 12.33%
7	4 = 1.76%	5	9 = 3.96%
8	.....	4	4 = 1.76%
9	.....	..	.....
10	....	2	2 = .88%
11	....	5	5 = 2.20%
12	1 = .44%	13	14 = 6.16%
13	1 = .44%	4	5 = 2.20%
14	.....	1	1 = .44%

These tabulations show that for endemic genera of all three types, regions 3, 4, 6 and 7 average 18.4 per cent., while the other ten regions average 1.3 per cent. For all genera of these three types, the four regions average 23.4 per cent., while the other ten regions average 4.1 per cent. A comparison with the distribution of all genera of flowering plants shows that the per cent. of endemic apically dehiscent genera in the four regions is 7.6 higher than that for all genera of plants, while for the other ten regions it is 1.3 lower. For all genera occurring, the per cent. of apically dehiscent genera is 1.7 higher for the four regions and 5.7 lower for the ten others. It will be seen that these figures become even more suggestive when the Indian region is not considered with tropical and extra-tropical South American and Australian regions. A comparison of the percents of this table with those for all genera of plants is facilitated by subtracting

the per cent. of all genera in the several regions from that denoting the apically dehiscent genera, and so representing the relative abundance of the latter in plus or minus quantities, as in table G.

TABLE G.

All Types. Relative Abundance.

Region.	Endemic.	Total.
1	+ .70	— 4.88
2	+ .93	— 1.00
3	+ 1.79	— 8.21
4	+ 28.06	+ 20.20
5	— 2.41	— 5.69
6	+ .53	— 1.20
7	— .28	— 4.01
8	— .27	— .69
9	— .04	— .29
10	— 5.32	— 14.03
11	— .79	— 5.02
12	— 1.56	— 5.74
13	— 3.84	— 11.92
14	— .85	— 8.07

The conclusions to be drawn from these figures seem clear and unmistakable.

Dalla Torre's Catalogus Hymenopterorum renders the large task of tabulating the distribution of the 137 genera of the Apidæ, and for comparison with them the 2,407 genera of Hymenoptera, including the Apidæ, relatively easy of accomplishment. The distribution of the insects is tabulated according to the same regions as the plants, merely for the purpose of direct comparison, and does not imply any taxonomic reasons for such an arrangement of the material. The distribution of the 137 genera of Apidæ is represented in table H, and that of the 2,407 genera of Hymenoptera in Table I.

TABLE H.
Genera of Apidæ.

Region.	Endemic	Others.	Total.
1	.....	25	25 = 18.24%
2	3 = 2.19%	11	14 = 10.21%
3	.....	23	23 = 16.78%
4	27 = 19.77%	37	64 = 46.71%
5	.....	17	17 = 12.40%
6	12 = 8.76%	22	34 = 24.81%
7	15 = 10.95%	24	39 = 28.46%
8	.....	4	4 = 2.91%
9	.....	..	.....
10	4 = 2.91%	47	51 = 37.22%
11	.....	38	38 = 27.73%
12	.....	26	26 = 18.97%
13	4 = 2.91%	36	40 = 29.19%
14	4 = 2.91%	46	50 = 36.49%

TABLE I.
All Genera of Hymenoptera.

Region.	Endemic.	Others.	Total.
1	44 = 1.82%	173	217 = 9.01%
2	7 = .29%	85	92 = 3.82%
3	120 = 4.98%	268	388 = 16.12%
4	283 = 11.75%	462	745 = 30.95%
5	10 = .41%	122	132 = 4.51%
6	50 = 2.07%	186	236 = 9.80%
7	40 = 1.66%	130	170 = 7.06%
8	6 = .24%	45	51 = 2.10%
9	.....	..	.....
10	125 = 5.19%	383	508 = 21.10%
11	14 = .58%	92	116 = 4.40%
12	29 = 1.20%	130	159 = 6.60%
13	210 = 8.72%	631	841 = 34.94%
14	699 = 29.04%	729	1428 = 59.30%

In endemic forms the per cent. of Apidæ in regions 4, 6 and 7 exceeds the per cent. of all Hymenoptera in those regions by 8, while for the

remaining eleven regions, of which seven—one of the seven being the Indian region—contain no endemic representatives of the family, it is 3.8 less than for the per cent. of all forms endemic. In all regions except the Antarctic some genera of the Apidæ are found, and are, indeed, distributed among the several regions with considerable uniformity. Tropical South America has 46.7 per cent, while the next largest number is that for the Mediterranean region, with 37.2 per cent., and the Northern region with 36.4 per cent. The average for the tropical and extra-tropical South American and Australian regions is 33.3 per cent., while for the other regions it is 19 per cent. The per cent. of all Apidæ occurring in 4, 6 and 7 exceeds the per cent. of all Hymenoptera in these regions by 17.4, while in the remaining eleven regions the per cent. of Apidæ occurring exceeds that for the total number of Hymenoptera by only 4.4.

As is well known to entomologists, the Hymenoptera are but little exploited systematically, and conclusions concerning their distribution must be only tentative. It is obvious from these tables that the data available upon the Hymenoptera are inadequate and unsatisfactory, and it will be many years before this vast group is sufficiently known systematically to justify any but tentative conclusions. Such data as we have, however, seem to point quite clearly to a great relative differentiation of the Apidæ in the regions in which our much more complete knowledge of the geographical distribution of plants has shown the apically dehiscent genera of the three types apparently adapted to pollination by the Apidæ to be most abundantly represented, and in view of the entire mass of evidence, it is difficult to refrain from the conclusion that there is a direct reciprocal relation between the distribution of the two classes of organisms. The evidence is at least so strong as to demand the co-operation of entomologists and botanists in the collection of data, which promises a better insight into some of the problems of taxonomy, biogeography and evolution.

One of the things which is most needed at the present time is a fuller knowledge of the insect visitors concerned in the pollination of flowers, especially of the flora of tropical regions, and while in many cases only the most careful investigations by one especially trained in floral ecology will yield satisfactory conclusions as to the stage of adaptation of a given species, it is also true that lists of visitors with some indication of their actions in visiting flowers such as can be easily prepared, and in many cases have been prepared, by the entomologist in his field studies, will enhance very greatly the value of his own publications, and will contribute much towards the data for larger problems.

NORTH AMERICAN TORTRICIDÆ.

BY PROF. C. H. FERNALD, AMHERST, MASS.

Eucosma Pergandeana, n. sp.—Expanse of wings, 16–20 mm. Head, palpi except a touch of fuscous on the outside, basal segment of the antennæ, white; flagellum of antennæ fuscous, annulate with white. Thorax varying from white to pale straw colour.

Ground colour of fore wings white or pale cream colour; the outer half of the costa with about eight oblique fuscous lines, which are lost in the fuscous dorsal portion of the wing. The remaining portion of the wing is streaked longitudinally with fuscous, but so diffuse as to render the lines very indistinct, and the surface behind and beyond the cell is nearly uniformly pale grayish fuscous in some specimens; the ocelloid patch near the anal angle is represented by fragments of three fine blackish lines, more or less obliterated and broken by a short vertical bar of more or less distinct metallic pale gray scales; a similar one beyond follows the outer margin and joins the first below, but is broken near the middle of its course. Fringe very pale gray, sprinkled with brownish atoms.

Hind wings pale gray, with a silken lustre; a little lighter beneath. Fringes white, with a very pale gray extra-basal line, not apparent in some specimens.

Abdomen above and beneath concolorous with the hind wings. Under side of fore wings fuscous except along the outer part of the costa, where they are lighter and reproduce the oblique stripes of the upper side.

Legs pale gray, with the tarsi of the middle and hind pair darker, and the tibiæ and tarsi of the fore legs also darker.

Described from thirteen males and three females before me, together with several others in too imperfect condition to include as co-types. They were captured as follows: Chicopee, Mass., June 21, 1896 (Knabb); Essex Co. Park, N. J., June 6, 1904 (Kearfott); Virginia, June 4, 1882 (Pergande); Toronto, Can., June 11–18, 1904 (H. S. Saunders); Texas; Loveland, Col., July, 1891 (Smith recd. from Lord Walsingham); Arizona.

The Arizona specimens and some of those from Colorado and Texas have the ground colour of the fore wings pale yellow or cream colour. This is not constant, but a gradation from one to the other, and therefore the subspecific name of *flavana* may be given to this form.

I have named this species after Mr. Theodore Pergande, of the Bureau of Entomology in the Department of Agriculture, Washington, D. C., from whom I received my first specimen, and for whose knowledge of insects and real worth as a gentleman, I have the highest respect.

Archips strianus, n. sp.—Expanse of wings, 21–25 mm. Head, thorax and fore wings very light wood-brown, with a slight tinge of pink in fresh specimens; palpi, collar and tegulæ marked more or less with dark brown.

Fore wings with dark brown intervenular stripes; the stripe from near the base of the wing to the end of the cell in front of the median vein, and also one from near the base of the subcostal to a little beyond the middle of the costa, is rather broad in the middle, and tapers toward each end; the three near veins 9, 10 and 11 are finer and nearly parallel; the stripes in front of veins 2 to 7 enlarge outwardly, and the first and last of these do not reach the cell, which has an oblique oval spot at the end in one example. There is a fine line along the fold not reaching the base of the wing, a more prominent line behind it from the base to the anal angle, and a wide stripe from the base to near the anal angle, leaving vein 1 between the two. Fringes fuliginous brown.

Hind wings fuliginous brown, with light stripes on the ends of some of the apical veins. Fringes much lighter than the wings, but with a dark dividing line.

Abdomen concolorous with the hind wings. Under side of all the wings somewhat lighter than above. and with the intervenular brown stripes more or less reproduced on the hind as well as the fore wings

Described from one male from London, Ont., and one female taken in Franconia, N. H., by Mrs. Slosson, in my collection, and also one taken in Quebec by Mr. A. W. Hanham, in the National Museum.

Cydia imbridana, n. sp.—Expanse of wings, 11–19 mm. Head, palpi and thorax pale yellowish, with a brownish spot on the outside of the second segment of the palpi, and with an intermixture of brown hairs at the end of the same segment. There is a brownish stripe along the middle line of the thorax, and a broader one on the middle of the tegulæ.

Fore wings pale straw or pale sulphur yellow, with oblique brownish lines, which fuse more or less on the cell and back to the hind margin, leaving the costal and terminal portions lighter than elsewhere; a more or less distinct brown stripe extends obliquely from near the middle of the costa to the end of the cell, and thence with an irregular outline to the basal third of the hind margin; the outer half of the costa has four or five geminate lines with yellowish metallic scales between, extending towards the outer margin around the outside of the ocelloid spot, which has two or three horizontal, broken black lines on the surface, and is limited internally and externally with yellowish metallic scales. Fringes pale yellow, tipped with brown near the apex.

Hind wings fuscous; the fringes white, with an extra-basal fuscous line. Under side of hind wings much lighter than above. Under side of fore wings of the same colour as the hind wings above, but with the outer part of the costa whitish, and reproducing the markings of the upper side.

The above description was made from three males and four females. I have ten other more or less imperfect specimens which I have not included as co-types. They were captured as follows: Amherst, Mass. (L. W. Goodell); South Abington, Mass., Aug 10, 1880 (J. E. Bates); Essex Co. Park, N. J., Aug. 14 (Kearfott); Virginia, Aug. 30, 1883 (Pergande); Penn.; Onaga, Kan. (Crevecœur); Winnipeg, Man. (Hanham).

NOTES ON SOME JAMAICAN CULICIDÆ.

BY M. GRABHAM, M. A., M. B., GOVERNMENT MEDICAL SERVICE, JAMAICA, WEST INDIES.

1. The larva and pupa of *Uranotænia Lowii*, Theobald (Fig. 23). Collected from a pool covered with *Marsilia polycarpa*, Hooker, near the bridge over the Rio Cobre Canal, Spanish Town, Jamaica. Found in association with *Culex fatigans*, Wied., and *Cellia albipes*, Theo., January 1st, 1905. Seen in the breeding-jar, the larvæ assumed a horizontal position, just below the surface film, the extremity of the siphon alone being in contact with the surface film. They moved forward in sharp jerks quite unlike any other Jamaican Culicid.

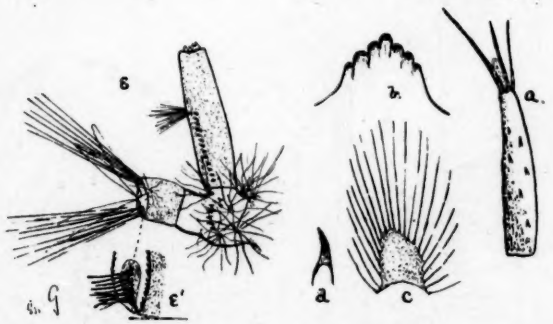

Fig. 23.—*a* antenna; *b* mentum; *c* scale of pecten; *d* scale of comb; *e* 8th and 9th abdominal segments; *e'* plate of origin of ventral tuft of hairs.

Head.—Very dark brown, almost black; antennæ short, no lateral tuft; shaft with a few short spines; terminal spines three, one somewhat longer than the others, about two-thirds the length of shaft; an ovate lamina between the spines; mentum with seven rounded teeth. Thoracic and anterior abdominal hairs feathered; posterior abdominal hairs simple; a number of tufted hairs on the abdominal segments in addition to the lateral hairs, no tufted hairs observed on the thorax. Rays of tufts few, long, slender.

Tube.—Subcylindrical, five times as long as broad; pair of tufted hairs at the middle of posterior border. Pecten of tube with double row of twelve to fifteen scales, scales very thin laminæ, bordered with many fine hairs (much longer than serrations figured by Felt, New York State

Museum, Bull. 79, Ent. 22, p. 344, 1904, in *U. sapphirina*, Osten Sacken). Row of pecten scales reach from the base of tube up to level of tufted hairs. Upper scales overlap one another. Comb of eighth segment, an irregular row of eight to nine simple curved spines springing from a chitinous plate. Chitinous collar completely encircling ninth segment. Dorsal and ventral tufts of hairs spring from oval chitinous plates attached to collar by narrow isthmuses (similar plates are figured by Felt in *U. sapphirina*, Osten Sacken). Anal papillæ long, slender, divergent.

Pupa.—Thorax and abdomen with scattered tufted hairs. Siphons subcylindrical, about eight times as long as broad; bases deeply chitinized. Fins acuminate, mid-rib not projecting beyond border. Borders deeply serrated; two halves of fins very unequal.

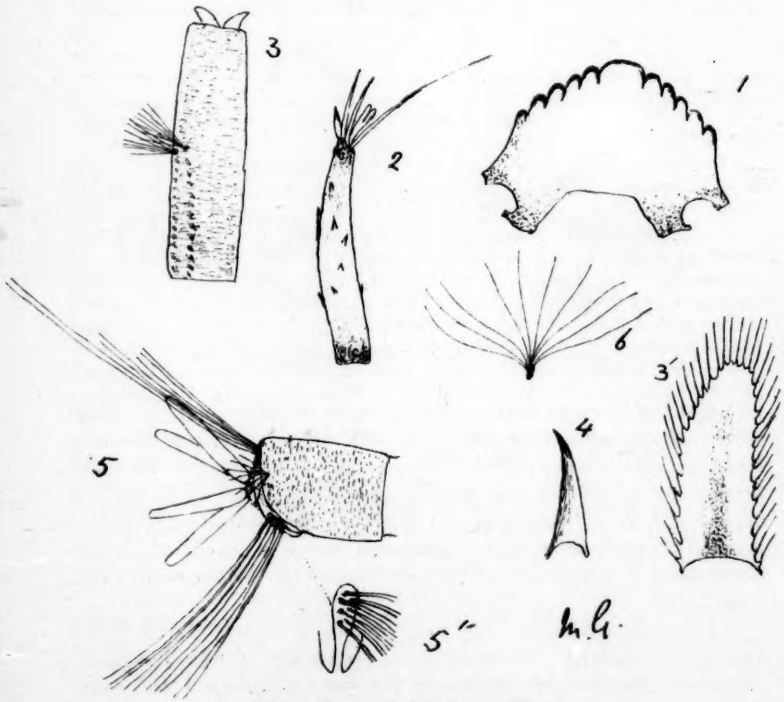

Fig. 24.—Uranotænia Socialis, n. sp., Theo.

2. Adult larva of *Uranotænia Socialis*, n. sp., Theo. (Fig. 24). Collected at Rockport, near Kinpta, Jamaica, in permanent pools, in association with *Cellia albipes*, Theo., and *Melanoconion atratus*, Theo. March and April, 1905.

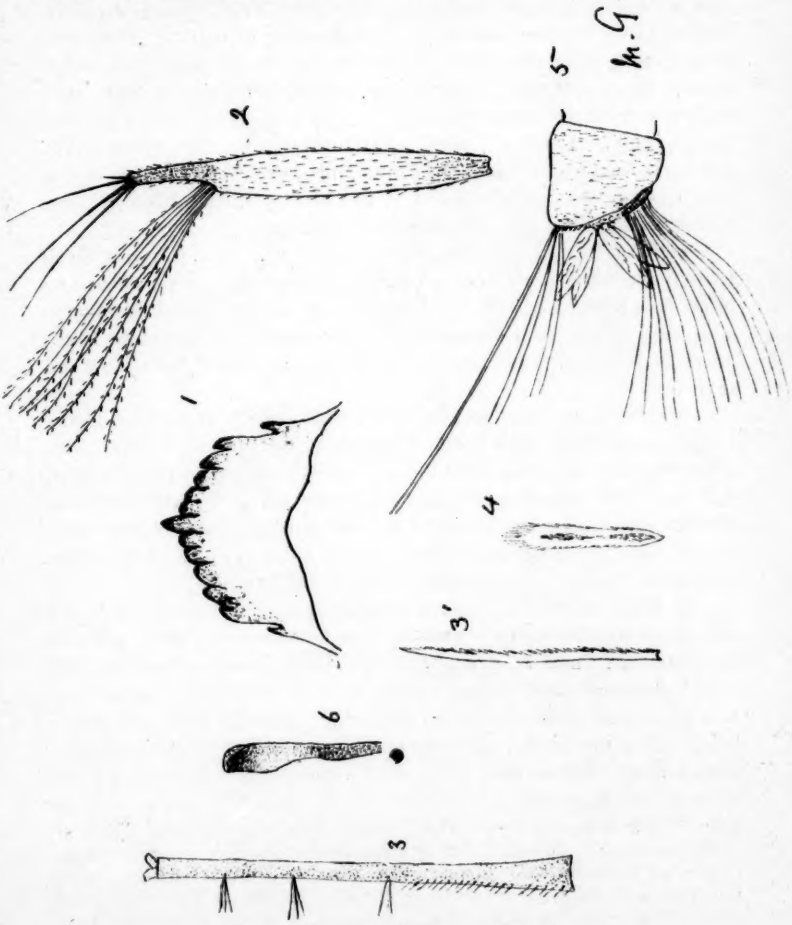

Fig. 25.—Melanoconion atratus, n. sp., Theo.

The adult larva at rest lies horizontally just under the surface film, and moves forward in spasmodic jerks. Thorax and abdomen sparingly covered with tufted hairs (6). Mentum stout, teeth eleven in number, apical tooth broad and flat (1). Antennæ with lateral hair tufts; three terminal hairs, innermost longest, ending in long thread; a lanceolate and a bilobed blade between hairs (2). Siphon nearly cylindrical, about four times as long as broad, a pair of tufted hairs at the middle of the posterior border. Pecten of 10–12 very thin scales bordered with fine hairs, each scale somewhat thickened in the centre. Row of scales reaches half way up tube (3.3′). Comb of 7 short, stout, curved spines, in a single curved row (4). Anal papillæ small. Ventral and dorsal tufts of hairs spring from spatulate processes attached to the main chitinous band by long, narrow isthmuses (5.5′). Chitinous collar complete.

3. Adult larva of *Melanoconion atratus*, n. sp., Theo. (Fig. 25). Small transparent hairy larvæ, with very delicate elongated siphons, abounding in pools in mangrove swamps. Collected all the year round. Mentum of 13 teeth; apical tooth elongated (1). Antennæ proportionately large; lateral hair tuft of many long feathered hairs; terminal hairs long and stout (2).

Siphon many times longer than broad, slightly constricted in the middle, with several pairs of tufted hairs along the posterior border. Row of pecten occurring along lower third. Scales about 20, long and delicate, with many fine hairs along the concave border (3.3′). Comb of numerous flattened elongated scales bordered with fine setæ (4). Anal papillæ small. Ventral tuft of hairs springing from separate plate (5). Chitinous collar complete. Siphons of pupa deeply chitinized at apices (6).

4. Adult larva of *Culex confirmatus*, Arr. (Fig. 26). Dark brown (nearly black), very active, voracious larvæ found in fresh water pools at the Rio Cobre Canal Dam, near Spanish Town, Jamaica, January 17th, 1905. Abdomen and thorax thickly covered with small spines (1). Mentum a wide angle of about 40 teeth (2). Antennæ short and stout; lateral tuft at the middle, of three hairs. Terminal hairs three in number, several shorter spines and a wedge-shaped lamella (3). Siphon about 1½ times as long as broad; a tufted hair at the posterior border near the apex. Row of pecten 15–20 strong spines, each with several smaller teeth at the base (4.4′). Comb of 20–25 short oval scales in a triangular patch; each scale bordered with numerous fine setæ (5). Anal papillæ lanceolate, nearly as long as the ventral tuft (6). Hairs of the ventral tuft spring from a separate plate. Chitinous collar of ninth segment complete.

Eggs elongated, laid separately on the surface of the water, papillæ narrow, long, flattened, parallel cells (7-7').

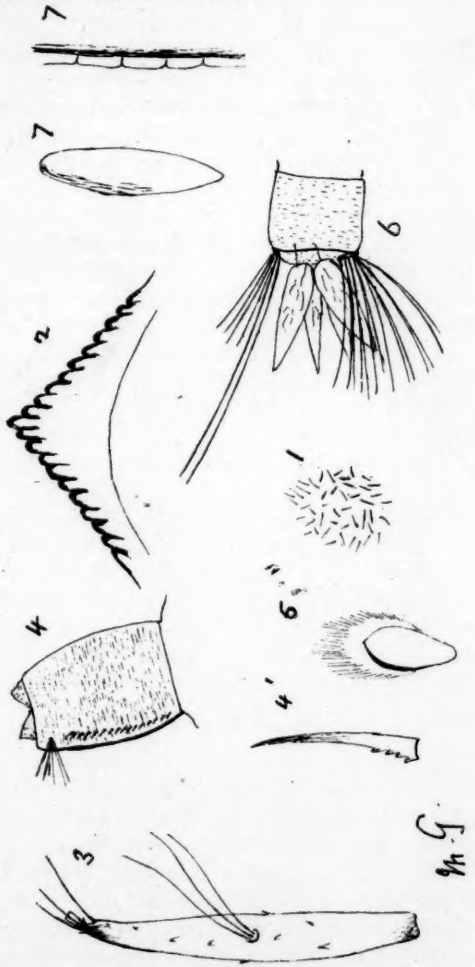

Fig. 26.—Culex confirmatus, Arr.

Adult larvæ of *Culex janitor*, Theo. (Fig. 27). Collected with *Deinocerites cancer*, Theo., from crab holes along the sea shore. The

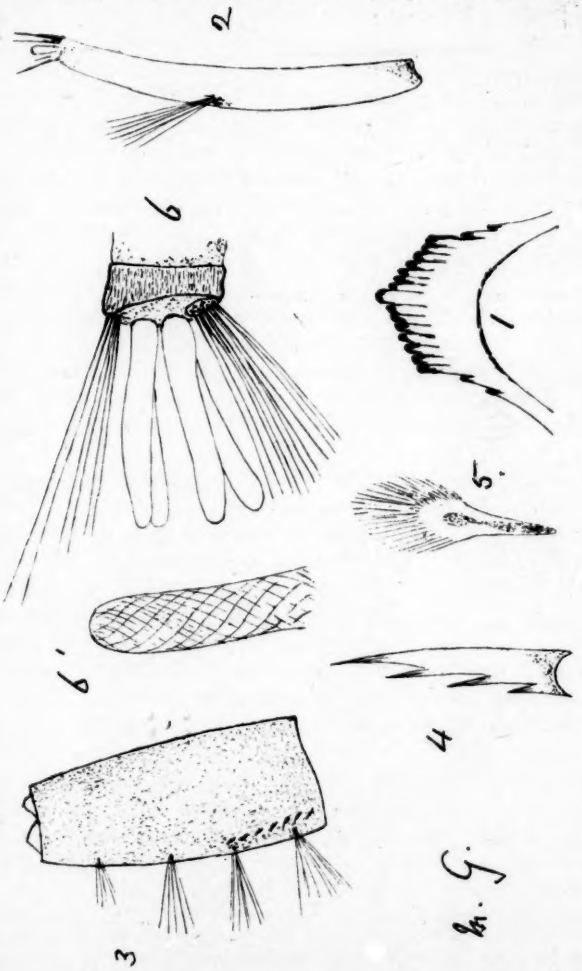

Fig. 27.—Culex janitor, Theo.

water in the holes is brackish. Larvæ abundant after seasonal rains in May and October. Mentum with steep sides; summit a wide angle of 15 rounded teeth (1). Antenna: shaft stout, quite smooth, devoid of spines; lateral hair tuft arising from the middle, composed of a few short, fine, simple hairs; terminal hairs short, three somewhat larger than the others, a flattened lamella between them (2). Siphon 2½ times as long as broad; four pairs of tufted hairs along posterior border, lowest pair arising quite near base (3). Row of pecten of seven toothed spines (4). Comb of 70–80 small scales arranged in a triangle, scale bordered with many fine hairs, shaft thickened along the centre (5). Narrow chitinous collar completely encircling ninth segment (6). Basal tuft of hairs arising from a separate plate. Anal papillæ cylindrical, rounded at the free ends, thickened by spiral interlacing strands of chitin (6′). *Eggs* laid in rafts.

6. Adult larva of *Culex microsquamosus*, n. sp., Theobald (Fig. 28). Collected in algæ-covered pools at the Rio Cobre Canal Dam, near Spanish Town, Jamaica, January 17th, 1905. Mentum a wide angle of many teeth, one of the outer teeth on each side rising considerably above the others (1). Antennæ stout and relatively large, lateral tuft of many feathered hairs. Apical hairs simple, 2 long, 2 short, a wedge-shaped lamella at apex (2).

Siphon many times longer than broad, in adult larvæ as long as the thorax and abdomen, slightly curved forward in its upper half; row of pecten in lower third of 15–18 scales, each scale a flattened lamella with 5–6 terminal serratures and 2–3 basal ones. Four bifid hairs along posterior margin of tube increasing in size from above downwards (3.3′). Comb of 30–40 delicate scales in a rough triangle, each scale bordered with fine hairs along the free margin (4). Anal papillæ ovate, nearly as long as ventral hair tuft (5). Chitinous collar of ninth segment complete, broad. *Eggs* laid in rafts.

Mosquitoes bred from these larvæ were forwarded to Mr. Theobald, who has kindly sent me the following description:

"*Culex microsquamosus*, n. sp.—Thorax clear bright brown, unadorned, pleura pale gray. Proboscis indistinctly pale-banded in the middle. Abdomen deep blackish, with basal pale bands. Legs deep brown, unbanded; base and venter of femora gray; apex of hind tibiæ pale. Palpi of male acuminate, last two segments hairy, jet black, remainder mostly ochraceous brown. Male genitalia with three flattened spines and one foliate plate on the inner lateral process.

" ♀.—Head deep brown, with narrow curved pale grayish scales and black and deep ochraceous upright forked ones, some small gray flat scales

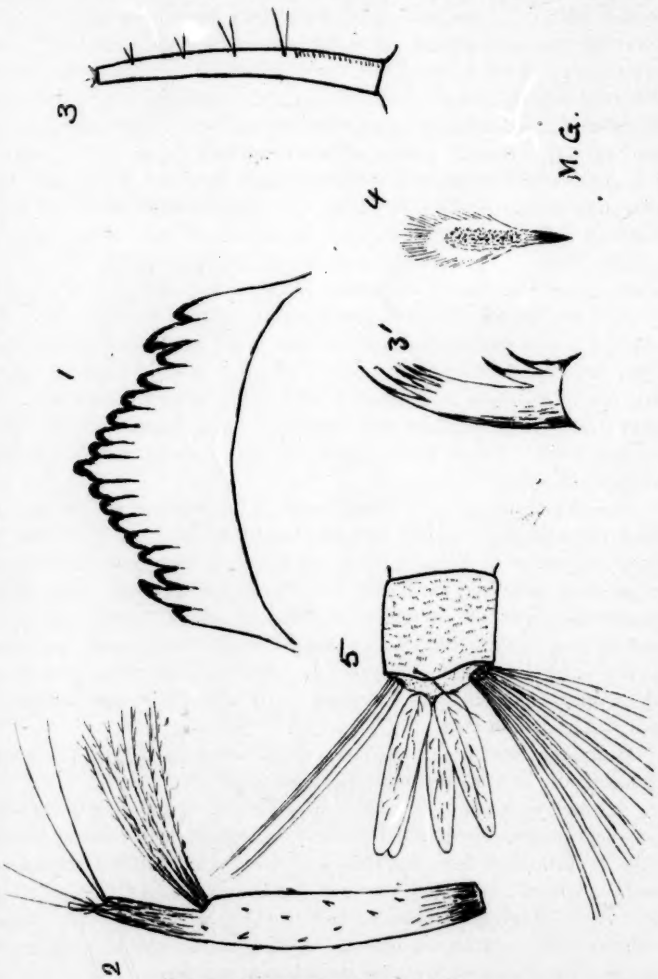

Fig. 28.—Culex microsquamosus, n, sp., Theo.

laterally. Clypeus brown. Proboscis black, showing a pale, indistinct median area in some lights. Palpi short, black-scaled, testaceous in the middle owing to a bare area. Antennæ deep brown. Thorax clear brown, scantily clothed with very small narrow curved pale bronzy scales (in some lights the metanotum is deeper brown); scutellum paler, gray in some lights, with small narrow curved bronzy-brown scales and rather long deep-brown border bristles, eight to the mid-lobe; metanotum ochraceous-brown to brown; pleura pale shiny gray, with some rows of small black bristles.

"Abdomen deep blackish brown, with basal pale bands to the third, fourth, fifth and sixth segments, traces on the seventh, pronounced on the eighth; the first segment is nude, shiny, testaceous, with brown hairs and two small median patches of black scales, border bristles pale ochraceous.

"Legs deep brown, unbanded; base and venter of femora gray, also to some extent the venter of the tibiæ and some pale scales beneath the tarsi. Apex of hind tibiæ with a pale spot, femoral and tibial hairs pallid; ungues small, equal, simple, much curved. Hind tibiæ and metatarsi about equal. Wings with typical Culex scales; first submarginal cell considerable longer and a little narrower than the second posterior cell, its base near the base of the wing, its stem one-third of the length of the cell; second posterior cell small, its stem about two-thirds the length of the cell; lower branch of the fork much curved; posterior cross-vein rather longer than the mid, not quite its own length distant from it; median vein-scales on the third rather large and dusky. Halteres with white stem and fuscous knob, sharply contracted. Length 4 mm.

"♂ similar to ♀. Palpi with acuminate apical segment, the last two and apex of the antepenultimate segment black, with black hair tufts, remainder of palpi brown. Proboscis deep brown, with an indistinct broad median pale band. Fork cells small, the first submarginal longer and narrower than the second posterior cell, its base nearer the base of the wing; the stem about two-thirds the length of the cell; stem of the second posterior nearly as long as the cell. Ungues of the fore and mid legs unequal, uniserrated; hind equal and simple. Genitalia with sickle-shaped claspers, internal prominence with three thick flat spines, the mid broadest, the smallest not hooked at the apex, foliate plate acute apically, with a prominent curved spine over its base (Fig. 29). Length 4 mm.

"*Observations.*—It comes very near *C. fatigans* and its allies, but the male genitalia differ, and the small thoracic scales at once separate it.

The form of the first fork-cell varies. A very marked *variety* occurs, in which the abdominal banding is almost absent. This variety shows a few pale scales on the apical borders of some of the segments, and the posterior border-bristles on the mid-lobe of the scutellum are seven in number. The characters are not sufficient to separate it as a distinct species, and the male sent with it exactly resembles that of the type. Another speci-

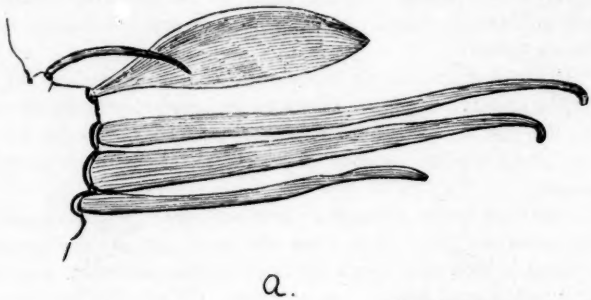

Fig. 29.—Culex microsquamosus, n. sp., Theo. *a* Internal lateral process of basal lobe; *b* clasper.

men differs from the type in the rather more elongate form of the wing, but resembles it in all other features, and cannot be separated."

Janthinosoma Johnstonii, n. sp.—Head covered with broad pale yellow and violet spindle-shaped scales; a cluster of black bristles between the eyes; a group of upright black forked scales at the back of the head. Eyes deep reddish-purple, bordered posteriorly by a row of white scales. Proboscis and palpi black, covered with black scales with violet reflections.

Clypeus black. Prothoracic lobes with white scales and long black bristles. Mesothorax covered with creamy white spindle-shaped scales on a black background; scales arranged more thickly on the lateral areas; a number of black bristles scattered over the mesothorax, especially abundant on the postero-lateral areas. Pleura with silvery scales and golden hairs. Scutellum with white scales and a median and two lateral groups of numerous long black bristles. Metathorax black.

Abdomen violet, basal segment with pearly-white scales and golden bristles; next five segments with lateral apical white-scaled areas; numerous black hairs scattered over the segments. Venter white scaled, with narrow basal bands of violet scales. Legs with metallic violet reflections, base and most of the venter of femora yellow scaled; knee spot white, small; third hind tarsus completely white except a few apical black bristles. Ungues all equal and uniserrate. Wings with the first submarginal cell a little longer and nearly as broad as the second posterior cell, its stem the same length as the cell; stem of the second posterior about as long as the cell; halteres with stem and knob pale yellow. Length 4.5 mm.

Observations.—Described from four ♀'s taken on a horse at the foot of the Red Hills, 5½ miles along the Molynes Road, Kingston, Jamaica, early in July, 1905. Found in association with the brilliant *J. discrucians*, Walker. It is apparently closely allied to *J. Arribalzagæ*, Giles, from which it may be distinguished by its wing venation, scutellar bristles and white third hind tarsus.

WHAT IS EUCHŒCA COMPTARIA, WALKER?

BY GEORGE W. TAYLOR, WELLINGTON, B. C.

In 1874 Dr. Packard[1] described two nearly allied species of Geometrid moths, one as *Larentia duodecimlineata*, the types being from California, and the other as *Larentia perlineata*, from New York. There can be no doubt, I think, as to the insect he had before him when describing *perlineata*. That species seems to be a distinct and easily recognized one, although there is a pretty and not uncommon variety of it which is sometimes confused with *Euchœca lucata* by those who are not very familiar with this group of moths.

We cannot so readily determine what the type of *12-lineata* was, because there are two species very similar in outward appearance, though belonging, it would seem, to different genera, occurring in California, whence

1. Proc. Boston Soc. Nat. Hist., XVI, 19, 1874.

Packard's type specimens came. We are indebted to Dr. Pearsall[2] for discriminating these two forms, and he has, quite rightly, I think, placed one in the genus *Euchæca*, and for the other has established the new genus *Nomenia*.

I may remark here that I have never refused, as Dr. Pearsall asserts,[3] to accept the genus *Nomenia*. On the contrary, I am satisfied that it is a perfectly valid one, and I have now in my own cabinet a fair series of both males and females of the type species, but I still think, as I stated in a previous paper, that it is not quite clear whether Packard, when describing *12-lineata*, had before him the *Nomenia* or the *Euchæca*, and that, therefore, until the point has been settled by the examination of the actual types, it cannot be certain to which form Packard's specific name should be applied.

Now, Walker[4] in 1860 described a moth from Nova Scotia as *Tephrosia ? comptaria*.

This species was not identified in American collections until 1895, when Dr. Hulst,[5] after inspecting the type specimen, pronounced it to be the *Larentia perlineata* of Packard, and in consequence the name *perlineata* has been dropped from our lists.

Quite recently, however, as I stated in my last note to this journal,[6] Mr. L. B. Prout, who has gone to a great deal of trouble to compare for me American material with Walker's types in the British Museum, has informed me that in this particular determination Hulst was in error, for that *comptaria*, Walker, equals *12-lineata*, Pack., not *perlineata*. Having great confidence in the carefulness and good judgment of my friend, I therefore list our species as follows :

Nomenia 12-lineata? Packard.
Euchœca comptaria, Walker.
= 12-lineata, Auct. pars.
= salienta, Pearsall.
Euchœca perlineata, Packard.

These entries to replace Nos. *3330* and *3331* in Dyar's Catalogue.

Dr. Pearsall disputes this arrangement, and writes :

2. CANADIAN ENTOMOLOGIST, XXXVII, 125, April, 1905.
3. CANADIAN ENTOMOLOGIST, XXXVII, 331, September, 1905.
4. Cat. Lep. Het. Brit. Mus., XXI, 406, 1860.
5. Entomological News, VI, 70, March, 1895.
6. CANADIAN ENTOMOLOGIST, XXXVII, 240, July, 1905.

Nomenia 12-lineata, Packard.

Euchœca salienta, Pearsall.

= 12-lineata, Auct. pars.

Euchœca comptaria, Walker.

= perlineata, Packard.

He argues in favor of this course in an article in this journal[7] headed "Whom shall we follow?" and decides that so far as he himself is concerned he will follow Dr. Hulst rather than Mr. Prout.

Dr. Pearsall's contention seems to be, that as Hulst has so long been our authority on North American Geometridæ, his word must be taken until it can be shown that Mr. Prout and myself are more likely to be right.

Of course one recognizes that this line of argument would be the sound one in many, perhaps in most, cases, but in this particular instance I believe Mr. Prout is right and Dr. Hulst wrong, and so, while admitting the latter's great authority, I shall not follow him, 1st, because the conclusions of Mr. Prout were arrived at after a very careful study and a more prolonged study than Hulst could possibly have given this one insect, and with a full knowledge of the different opinion Hulst had expressed; and 2nd, because in all the rest of the synonomy given by Hulst under the species we are considering, the Doctor is entirely and manifestly wrong, showing that he was not specially well informed as to this species or group of species.

I ask, will Dr. Pearsall follow Hulst and accept the other synonyms placed with *perlineata* under *comptaria*, Walker?

One of them is *condensata*, Walker, which should be placed under *Euchœca lucata*, Guenée. The other is *inclinataria*, Walker, of which the type (as a glance at the description will show, and as Hulst himself once declared[8]) is a specimen of *Xanthorrhoe ferrugata*, a species with fully pectinated antennæ, and hardly to be confused with *comptaria* by the veriest tyro.

I argue then that if Dr. Hulst was wrong in two cases out of three, I am justified in taking my friend's opinion rather than his in the third instance.

7. CANADIAN ENTOMOLOGIST, XXXVII, 331, September, 1905.
8. Entomological News, VI, 70, March, 1895.

CATALOGUE OF THE GENERA OF THE HEMIPTEROUS FAMILY APHIDÆ, WITH THEIR TYPICAL SPECIES, TOGETHER WITH A LIST OF THE SPECIES DESCRIBED AS NEW FROM 1885 TO 1905.

BY G. W. KIRKALDY, HONOLULU.

It is now twenty years since the lamented Jules Lichtenstein published the first—and, unfortunately, last—part of his proposed monograph of the Aphidæ (a). This instalment contained a list, without references, of the genera and species known to Lichtenstein, but, as will be seen from the following pages, a large number of names was omitted and some were misapplied, so that a new list of genera should be useful, having regard to the interest and importance of the family. As the Aphid volume of Lethierry and Severin's "Catalogue général des Hémipterès" may be expected to appear within a few years, I have not added a list of all the species; those, however, described since Lichtenstein's Monograph, are now enumerated.

This list was prepared originally for my own use in studying the Hawaiian Aphid fauna, all the forms of which are introduced, and, indeed, but few in number. The differences of opinion as to the validity of certain generic conceptions are so varied that it may well be that mistakes have been made here in this connection, as I can scarcely find two authors agreeing in their conception of what constitutes a genus in this family.

The works cited are almost all in my own library, and I am therefore responsible for the accuracy of the references, except in a few cases marked †.

The following abbreviations will materially shorten the paper.

Ann. Belg. = Annales de la Société Entomologique de Belgique.

Ann. France = Annales de la Société Entom. de France.

Bull. France = Bulletin de la Société Entom. de France.

Bull. Ital. = Bulletino Soc. Entom. Italiana.

Cowen Colorado = Cowen, in Bull. Colorado Agr. Exp. Sta., 31.

Hunter Bull. Iowa = Hunter, in Bull. Iowa Agr. Coll. Sta., 60.

Lichtenstein Mon. peup = †Lichtenstein, Monographie des pucerons du peuplier.

Oestlund Bull. = Oestlund, Bull. Geol. Survey, Minnesota IV.

Oestlund Report = Oestlund, 14th Ann. Rep., Geological Survey, Minnesota.

(a) "Les Pucerons. Monographie des Aphidiens," pp. 1–188, Pls. I–IV (coloured). Montpellier, 1885.

December, 1905.

N. B.—1. The "Zoological Record" and "Bericht der Entom." incorrectly cite the source of Zehntner's papers, giving only the "separate" pagination and source. There are in Java numerous experiment stations, with entomological staff, etc.; the results of their researches, entomological, chemical, agricultural, are mostly published in the "Archief voor de Java-Suikerindustrie," a periodical now in its 13th year, but which apparently finds its way to very few American or European libraries. The entomological contributions, however, are distributed by their authors, separately paged and as "contributions" to their particular experiment station, the plates being unnumbered or with the numbers of the original impress. For instance, *Aphis adusta* was described (on p.?) of the 5th vol. of the "Archief" (1897) and reissued separately paged in the "Mededeelingen van het Proefstation Oost-Java, niewe serie No. 37." It is these latter references that are quoted in the "Record" and "Bericht."

I am a little uncertain of the exact dates of Koch's genera. The "Bericht" states, heft 1–4 (1854); 5–7 (1855); 8–9 (1856); the rest 1857. Heft 8 began p. 237, but I am not quite certain where heft 9 finished.

N. B.—2. "Kholodkovsky" is also written "Cholodkowsky."

Subfamily *Aphinæ* (b).

1. Macrosiphum, Passerini, 1860, Gli Afidi, 27, t. *rosæ* (L.), Pass.
   = ‖Siphonophora, Koch, 1855, Pflanzenläuse, 150.
   = Nectarophora, Oestlund, 1887, Bull. Minn., 78.
2. Drepanosiphum, Koch, 1855, Pflanzenläuse, 201, t. platanoides, Koch, Licht.
   = ‖Drephanosiphum, Hunter, 1901, Bull. Iowa. 91.
3. Phorodon, Passerini, 1860, Gli Afidi, 27, t. *humuli* (Schrank), Pass.
4. Nectarosiphon, Schouteden, 1901, Ann. Belg., XLV, 112.
   = ‖Macrosiphum, Oestlund, 1886, Rep. Minn., 27, t. *rubicola* (Oestl.)
5. Megoura, Buckton, 1876, Mon. Aph., I, 188, t. *viciæ*, Buckt (c).
6. Rhopalosiphum, Koch, 1854, Pflanzenläuse, 23, t. *nymphææ* (L.) Gerst.
   = Siphocoryne, Passerini, 1860, Gli Afidi, 28, t. *nymphææ* (F.), Pass.
   = †Liosomaphis, Walker, 1868, Zoologist, 1119 (inedit ?).
   = Amphorophora, Buckton, 1876, Mon. Aph., I, 187, t. *ampullata*, Buckton.
   = Rhopalosiphon, Scudder, 1882, Nomencl. Zool., I, 294.

(b) The probable origin of the word "Aphis" does not allow of the forms Aphidinæ, etc.

(c) Kholodkovsky regards this as a syn. of No. 6.

7. Monellia, Oestlund, 1887, Bull. Minn., IV, 44, t. *caryella* (Fitch), Oestlund.
8. Calaphis, Walsh, 1862, Pr. Ent. S. Philad., I, 301, t. *betulella*, Walsh.
9. Mastopoda, Oestlund, 1886, Rep. Minn., 52, t. *pteridis*, Oestl.
10. Myzus, Passerini, 1860, Gli Afidi, 27, t. *cerasi* (F.), Pass.
    = Mysus of some lists.
    = Ceylonia, Buckton, 1891, Ind. Mus. Notes, II, 35, t. *theæcola*, Buckton.
11. Hyalopterus, Koch, 1854, Pflanzenläuse, 16, t. *pruni* (F.), Pass., 1860.
    = Hyalopteris, Hunter, 1901, Bull. Iowa, 92.
12. Toxoptera, Koch, 1856, op. c., 253, t. *aurantiæ*, Koch.
13. Aphis, Linné, 1758, Syst., Nat. Ed., X, 451, t. *sambuci* (L.), Lam., 1801.
    = †Loxerates, Rafinesque, 1818, Amer. Monthly Mag., III, 16.
14. Hyadaphis, Kirkaldy, 1904, Entomologist, XXXVII, 279, t. *hyadaphis*, n. n. (= ‖*xylostei*, Schrank).
    = ‖Siphocoryne, Passerini, 1863, and authors (not Passerini, 1860).
15. Pterocomma, Buckton, 1879, Mon. Aph. II., 142, t. *pilosa*, Buckton.
16. Aristaphis, n. n.
    = ‖Cladobius, Koch, 1856, Pflanzenläuse, 251, t. *populea* (Kalt.)*.
    = ‖Aphioides, Passerini, 1860, Gli Afidi 28.
17. Melanoxantherium, Schouteden, 1901, Ann. Belg., XLV, 113.
    = ‖Melanoxanthus, Buckton, 1879, Mon. Aph., II, 21, t. *salicis* (L.) Buckt. (d)
18. Brachycolus, Buckton, 1879, Mon. Aph., II, 146, t. *stellariæ* (Hardy), Buckton.
19. Cryptosiphum, Buckton, 1879, op. c., 144, t. *artemisiæ*, Buckton.
20. Pergandeida, Schouteden, 1903, Zool. Anz., XXVI, 686, t. *ononidis*, Schout.
21. Microsiphum, Kholodkovsky, 1902, Isviestiya S. Peterb. Liesn. Instit., 53, t. *ptarmicæ*, Khol. (e).

(d) According to the Zool. Record (which gives a reference to P. E. S., Wash., II, 517, instead of †P. Ac., Wash., II, 517), Pergande regards 15, 16 and 17 as one genus; Kholodkovsky regards *Pterocomma* as a synonym of *Chaitophorus*.

(e) This is not recorded in "Zool. Record." I have only a separately paged, undated copy before me, and I am indebted to the "Rysskoye Entom. obosriniye," III, 149 (1903), for the reference.

22. Chaitophorus, Koch, 1854, Pflanzenläuse, p. 1, t. *populi* (L.), Gerst.
= ‖Chætophorus of many lists.
= ‖†Phyllophorus, Thornton, 1852, Tr. Micr. Soc., Lond., p. ?, t. *testudinarius*.
= †Phyllophora, Fernie, 1852, Morris Nat., II, 265, *testudinacea*.
= ‖†Chelymorpha, Lane Clark, 1858, The Microscope, p. ?, t. *phyllophora*, Clark [= *aceris* (L.)].
= †Periphyllus, Van der Hœven, 1863, Tijdschr. Ent., VI, 7, t *testudo*, Hœven [= *aceris* (L.)].
= †Arctaphis, Walker, 1870, Zoologist, 2000 (? inedit).
= Rhyllophorus (!) Scudder, 1882, Nomencl. Zool., I, 246.

Subfam. 2.—*Callipterinæ*.

23. Bradyaphis, Mordvilko (f).
24. Sipha, Passerini, 1860, Gli Afidi, 29, t. *glyceriæ* (Kaltenbach), Pass.
25. Callipterus, Koch, 1855, Pflanzenläuse, 208, t. *juglandis* (Kalt.), Pass., 1860.
= Pterocallis, Passerini, 1860, Gli Afidi, 28, t. *alni*, Pass., = *maculata*, Heyden.
= ‖Ptychodes, Buckton, 1881, Mon. Aph., III, 39, t. *juglandis* (Kalt.), Buckt.
= Panaphis, Kirkaldy, 1904, Entom. XXXVII, 279.
26. Kallistaphis, n. n., t. *betulicolæ* (Kalt.).*
= ‖Callipterus, Buckton, 1881, Mon. Aph. III, 12 (not containing Koch's type).
27. Myzocallis, Passerini, 1860, Gli Afidi, 28, t. *coryli* (Goetze), Pass.
= Mysocallis Rondani, 1874, Bull. Ital. VI., 62 (g).
28. Phyllaphis, Koch, 1856, Pflanzenläuse 248, t. *fagi* (L.), Koch.
= Phillaphis of some lists.
29. Symydobius, Mordvilko (h).

(f) I cannot trace this. Kholodovsky (1898) in a Forestry paper issued (separately? or perhaps in the Isviestiya S. Peterb. Liesn. Instit. ?), under the title "Obyasnityelny Katalog Kollyektsy tlyei (Aphidæ)," described it in an analytical table, but without mention of species (p. 6). It is omitted in the later 1902 paper.

(g) Kholodkovsky considers 25, 26 and 27 to be only one valid genus.

(h) Included by Kholodkovsky & Schouteden in their paper, but without reference—I cannot trace it.

30. †Pterochlorus, Rondani, 1847, Nuov. Ann. Sci. Nat. Bologna (2) VIII, p. ? type || *roboris* Rond. = *longipes* Duf.
Subj. 1. Dryaphis, Kirkaldy, 1904, Entom. XXXVII, 279, type *roboris* (L.).*
= ||Dryobius, Koch, 1855, Pflanzenläuse, 225, t. *roboris* (L.)

Subfamily 3.—*Lachninæ.*

31. Asiphum, Koch, 1856, Pflanzenläuse, 246., t. *ligustrinellum* (Koch), Lichtenstein, 1885.
32. Stomaphis, Buckton, 1883, Mon. Aph. III, 61, t. *quercus.*
33. Lachnus, Burmeister, 1835, Handbuch Entom. II, 91, t. *pinicola* (Kalt.), Pass.
= Cinara, Curtis, 1835, Brit. Entom., 576, t. *pini*, Curtis.
34. Paracletus, Heyden, 1837, Mus. Senckenberg II, 295, t. *cimiciformis* (Kalt.), Heyden.
35. Trama, Heyden, op. c., 293, t. *troglodytes*, Heyden.

Subfamily 4.—*Eriosomatinæ.*

36. Eriosoma, Samouelle, 1819, Entom. Useful Compendium 232, t. *mali* [= *lanigera*, Hausm.]
= †Myzoxyle, Blot., 1824, Mem. Soc. Linn., Calvados, I, p. ?
= †Myzoxylus, Blot., 1830, Mem. Soc. roy. agr., Caen. III, 332.
= †Myzoxile, Avrilly, 1834, Du Myzoxile, p. 1 (t. of these three = *lanigera*).
37. Schizoneura, Hartig, 1841, Zeitschr, Entom. III, 365, t. *ulmi* (L.), Pass, 1860.
= †Mimaphidus, Rondani (ref.).
38. Anoecia, Koch, 1857, Pflanzenläuse, 275; t. *corni.*
= Anooecia, Buckton, 1881. Mon. Aph., III, 108.
39. Mindarus, Koch, 1857, Pflanzenläuse, 277, t. *abietinus* (i).
40. Schlechtendalia, Lichtenstein, 1884, Stettin Ent. Zeit., XLIV, 242, t. *chinensis.*
41. Pachypappa, Koch, 1856, Pflanzenläuse, 269, t. *marsupialis.*
= Pachypapa of some lists.
= Pacyhpapa (!) Lichtenstein.
42. Colopha, Monell, 1877, Canad. Ent. IX, 102, t. *ulmicola.*
43. Phloeomyzus, Horváth, 1896, Wien. Ent. Zeit. XV, 5, t. *passerinii* (Lichtenstein), Horv.
= ||†Löwia, Lichtenstein, 1886, Mon. peupl., 37, t. *passerinii* (Sign.), Licht.

(i) Kholodkovsky considers 36, 37, 38 and 39 to form one genus.

44. Tetraneura, Hartig, 1841, Zeitschr, Entom. III, 365, t. *rugicornis*, Hartig.

45. Geoica, Hart, 1894, 18th Rep. State Ent., Illinois, 101, t. *squamosa*, Hart (k).

46. Hormaphis, Osten Sacken, 1861, Stettin Ent. Zeit. XXII, p. 422, t. *hamamelidis*.

47. Byrsocrypta, Haliday, 1839, Ann. Nat. Hist. II, 190, t. *bursaria* (Linn.), Hal.
= Brysocrypta, Westwood, 1839, Intr. Mod. Class. Ins. Synopsis, 118.
= Pemphigus, Hartig, 1841, Zeitschr. Ent. III, 365, t. *bursaria* (Linn), Pass., 1860.
= Pemphilus (!) Kaltenbach, 1843, Monographie, 180.
= †Aphioides, Rondani, 1847, Nuovi Ann. Sci. Nat. Bologna (2), VIII, 439, t. *bursaria* (L.), Rond.
= †Baizongia, Rondani (? ref.).
= Thecabius, Koch, 1857, Pflanzenläuse, 294, t. *populneus*.
= Melaphis, Walsh, 1866, Proc. E. S , Philad., VI, 281, t. *rhois* (Fitch).*

48. Stagona, Koch, 1857, op. c., 284, t. *xylostei*, Koch.

49. Holzneria, Lichtenstein, 1875, Bull. France (5) V., p. LXXVI, t. *poschingeri* (Holzner), Licht.

50. Prociphilus, Koch, 1857, Pflanzenläuse, 279, t. *bumeliæ* (Schr.).

51. Rhizobius, Burmeister, 1835, Handb. Entom. II, 87, t. *pilosellæ*, Burm.*
= Rhizophthiridium, Vanderhœven, 1849, Handb. Dierkunde I, 508 [n. n. for Rhizobius].
= Rhyzoicus, Passerini, 1860, Gli Afidi, 30, t. *sonchi*, Pass. (l).

52. †Rhizoctonus, Mokrzhetsky, 1897, Trudy Russk. Entom. XXX, 438, t. *ampelinus* [genus not separately described; the first separate description was probably by Kholodkovsky, 1898, Forestry work already cited; there he attributes the genus to Horváth].

53. Aploneura, Passerini,† 1863, Arch. Zool. II, p. ?, t. *lentisci*.
= Haploneura of some lists.

54. Vacuna, Heyden, 1837, Mus. Senckenberg II, 289, t. *coccinea*.
= Thelaxes, Westwood, 1839, Intr. Mod. Class Ins., Synopsis 118, t. *quercicola*, Westw.

(k) Horvath considers 44 and 45 one genus.

(l) Kholodkovsky considers 48, 49, 50 and 51 as synonyms of 47.

55. Glyphina, Koch, 1856, Pflanzenläuse, 259, t. *betulæ* (Kalt.), Koch. (m).

56. Cerataphis, Lichtenstein, 1882, Bull. France (6), II, p. XVI, t. *latæniæ* (Boisd.), Licht.

= ‖Boisduvalia, Signoret, 1868, Ann. France (4), VIII, 400, t. *latæniæ* (Boisd.), Sign., [nom. nudum].

= Ceratovacuna, Zehntner, 1897, Archief Java Suikerindustrie, V, No. 10, p. ?, t. *lanigera*, Zehntner (n).

= Ceratophis (!) Hempel, 1902, Ann. Mag. Nat. Hist. (7), IX, 400.

(To be continued).

NITIDULA BIPUSTULATA IN A NEW ROLE.

BY G. H. FRENCH, CARBONDALE, ILL.

One day last summer I received a letter from a physician in a town near Carbondale, stating that one of his patients had voided some live beetles, and asking me if I cared to see them. Assuring him that I did, he sent me several specimens of the species above mentioned. Not having this species in our collection, one of them was sent to Dr. F. M. Webster, Dept. of Agriculture, Washington, who identified it for me, but doubted its being an intestinal parasite.

Briefly stated, the history of the case is as follows: The man came to the doctor several days before his writing to me, stating that he had found the insects in his excreta. The doctor told him they must have come from the ground on which he had voided the excreta; and he further advised him to use a clean chamber next time. The next day the man came back to the doctor with a lot of the beetles, stating that he had done as directed, and that he passed as many as a tablespoonful of the beetles.

On talking with the doctor a few days ago, I find that the man has been voiding these beetles for some time, and that six years ago his son passed quantities of the same beetles. The son has since died of typhoid fever. The boy told his father about his passing them, and this led the latter to notice his own excreta. The beetles were voided alive, but soon died after crawling a little way from the excreta.

This is the first instance I have known, either from personal observation or from the literature, of adult insects being voided from the enteric canal of either a man or a related mammal.

(m) Kholodkovsky places this with 54.

(n) Spelt Ceratovacunna both in Zool. Record and Bericht der Entom., both of which give incorrect reference.

Mailed December 9th, 1905.

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